



DOCKET NO. 5988-037-27

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

IN RE APPLICATION OF: Yukio NISHIMURA et al.      ART UNIT: 1752  
SERIAL NO.: 10/046,080      EXAMINER: Yvette C. Thornton  
FILING DATE: January 16, 2002  
FOR:      RADIATION-SENSITIVE RESIN COMPOSITION

**DECLARATION UNDER 37 C.F.R. §1.132**

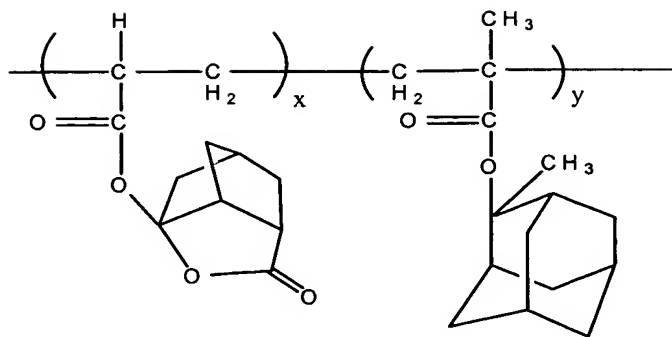
We, Yukio Nishimura, Masafumi Yamamoto, Atsuko Kataoka, and Toru Kajita, do hereby declare and state that:

1. We are scientists currently employed by JSR Corporation. We have reviewed the pending application, including the claims, and the outstanding Office Action dated April 6, 2004.

2. We understand that Claims 1-11 and 14 were rejected under 35 U.S.C. §103(a) as allegedly being obvious over U.S. Patent Application Publication No. US 2001/0026901 A1 to Maeda et al. (hereinafter referred to as "Maeda") in view of U.S. Patent No. 6,187,504 B1 to Suwa et al. (hereinafter referred to as "Suwa"). We also understand that Claim 12 was rejected under 35 U.S.C. §103(a) as allegedly being unpatentable over Maeda in view of Suwa as applied to Claims 1-11 and 14 above, and further in view of U.S. Patent No. 6,045,970 A to Choi (hereinafter referred to as "Choi") and that Claim 13 was rejected under 35 U.S.C. §103(a) as allegedly being unpatentable over Maeda in view of Suwa as applied to Claims 1-11 and 14 above, and further in view of U.S. Patent No. 6,093,517 A to Ito (hereinafter referred to as "Ito").

3. We have reviewed the Maeda, Suwa, Choi, and Ito references cited in the Official Action.

4. We understand that the Official Action is relying upon the disclosure in Maeda of a polymer having the following structure:



¶¶ 68-69 of Maeda.

5. It is also our understanding that Maeda does not identically disclose a composition as set forth in Claim 1. In particular, Maeda does not disclose a composition comprising both a resin (A) and a photoacid generator (B) embraced by formula (3) as set forth in Claim 1.

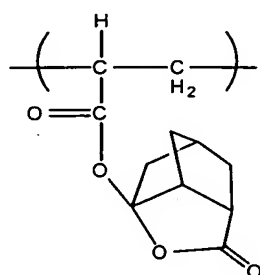
6. We also understand that the Official Action is relying upon the disclosure in Suwa of an acid generator embraced by formula (3) of Claim 1. However, it is also our understanding that Suwa does not identically disclose a composition as set forth in Claim 1 comprising both a resin (A) and a photoacid generator (B).

7. We have personally conducted the following experiments in which we formulated and tested resist compositions. In particular, we have formulated and tested a resist composition comprising a resin (A) and an acid generator (B) as set forth in Claim 1 and compared these properties to a similar composition comprising the same resin (A) and a different photoacid generator not embraced by formula (3) and therefore not within the scope of the claims.

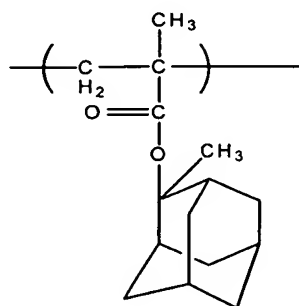
8. The specific compositions used in our evaluation are set forth below:

	Example 13	Comparative Example 2
Resin	A-1 (100)	A-1 (100)
Acid Generator	B-1 (3.0)	b-1 (3.0)
Acid Diffusion Controller	C-1 (0.10)	C-1 (0.10)
Other Additives	—	—
Solvent	E-1 (530)	E-1 (530)

9. Resin A-1 has recurring units (i) and (ii) at a molar ratio of 60:40, respectively:



(i)



(ii)

This resin thus meets the definition of resin (A) as set forth in Claim 1.

10. The photoacid generator referred to as B-1 above is the compound 4-n-butoxy-1-naphthyltetrahydrothiophenium nonafluoro-n-butanesulfonate.

11. The photoacid generator referred to as b-1 above is the compound triphenylsulfonium trifluoromethanesulfonate.

12. The acid diffusion controller referred to as C-1 above is the compound tri-n-octylamine.

13. The solvent referred to as E-1 above is the compound 2-heptanone.

14. The photoacid generator of Comparative Example 2 is the same as that used in the Examples (*i.e.*, Examples 29, 32, and 33) of Maeda.

15. The compositions of Example 13 and Comparative Example 2 were evaluated as resists. The conditions used in the evaluation are set forth below.

	<b>Example 13</b>	<b>Comparative Example 2</b>
<b>Resist Film Thickness (<math>\mu\text{m}</math>)</b>	0.4	0.4
<b>Substrate</b>	ARC	ARC
<b>Post Bake</b>	130 sec @ 130 °C	90 sec @ 90 °C
<b>Post Exposure Bake</b>	140 sec @ 140 °C	90 sec @ 90 °C

16. The results of the resist evaluation are set forth below:

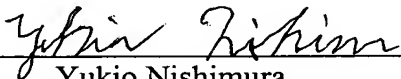
	<b>Example 13</b>	<b>Comparative Example 2</b>
<b>Radiation Transmittance at 193 nm (%)</b>	73	60
<b>Sensitivity (<math>\text{J}/\text{m}^2</math>)</b>	85	142
<b>Resolution (<math>\mu\text{m}</math>)</b>	0.15	0.18
<b>Dry-Etching Resistance</b>	0.8	0.9
<b>Pattern Configuration</b>	Good	Good

17. As can be seen from the above data, the composition of Example 13 exhibited significantly better results in radiation transmittance, sensitivity and dry-etching performance than the composition of Comparative Example 2.

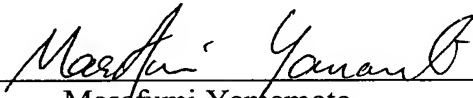
18. These differences in resist performance between the compositions of Example 13 and Comparative Example 2 are both significant and unexpected.

All statements made herein of my own knowledge are true and all statements made on information and belief are believed true. Further, We are aware that willful false statements and the like are punishable by fine, imprisonment or both, 18 U.S.C. §1001, and that such willful false statements may jeopardize the validity of the above-captioned patent application, and any patent to issue thereon.

DATE: July 8, 2004

  
Yukio Nishimura

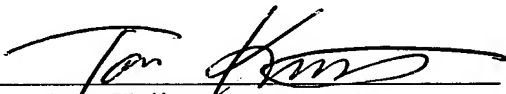
DATE: July 8, 2004

  
Masafumi Yamamoto

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DATE: July 8, 2004

  
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